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Lectotypification of the name *Umbilicaria esculenta*

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Abstract — The protologue and typification of the name *Umbilicaria esculenta* [≡ *Gyrophora esculenta*], an East Asian lichen-forming fungus, are discussed. The lectotype is designated from the Miyoshi collection deposited in TNS.

Key words — iwatake, Japan, lichenised *Ascomycota*, nomenclature, *Umbilicariaceae*

Introduction

Although the family *Umbilicariaceae* has been studied for many years, questions regarding typification remain to be solved (e.g. Wei & Jiang 1993; Jørgensen et al. 1994; Hestmark 2007, 2010, 2014; Davydov et al. 2014).

Umbilicaria esculenta (*Umbilicariaceae*) is characterized by a large rigid thallus with a matte, smooth to rough and particularly schizidiate upper thallus surface; the lower surface is velvet-like due to dense black branched rhizinomorphs with multiseptate (400–500 cells or more) thalloconidia. The distribution of the species is restricted to East Asia (Japan, Korea, Russian Far East, and China), where it grows mostly in forests on steep siliceous rocks in upland areas of the warm temperate region and the lowlands of the cool temperate regions (Satô 1968, Blum 1969, Wei & Jiang 1993, Yoshimura 1993, Moon 1999).

Umbilicaria esculenta is well known in Eastern countries as an edible lichen named "Iwatake" in Japan, "Sheakki" in Korea, and "Shi-er" in China. The species is also used in medicine (e.g., Hirabayashi et al. 1989, Yoshimura 1993 [and references in that paper], Kim & Lee 2006, Wu et al. 2014, Xu et al. 2014).

However, since the name *U. esculenta* has yet to be typified, the purpose of this study is to elucidate its history and to designate its lectotype.

Original material

Prof. Manabu Miyoshi (1862–1939), a Japanese botanist who mainly researched cherries and irises, also collected lichens and published several lichenological papers. In one of these he described *Gyrophora esculenta* (the basionym of *Umbilicaria esculenta*), the first lichen described by a Japanese scientist (Miyoshi 1893). Although the protologue lacks a Latin description and is written in German, the name was validly published according to the ICN (2012: Art. 38.1, 39.1). No specimens are cited in the protologue, but Miyoshi (1893) mentioned that the species is known from "Mts Kiso, Nikko, Kumano u. s. w."; he also referred to its occurrence in his earlier report on a botanical excursion to Mt. Ontake (Miyoshi 1890) but provided no description or diagnosis for this taxon.

Llano (1950) and Wei & Jiang (1993), who did not see the type material of *U. esculenta*, considered the type to be "In the Botanical Institute, Tokyo University, from Japan, leg. Miyoshi" (Llano 1950: 189). Miyoshi's collections, formerly kept in TI (University of Tokyo), are currently deposited in the Herbarium, National Museum of Nature and Science, Tsukuba, Japan (TNS), and we have found only one collection associated with the protologue of *Gyrophora esculenta* in this herbarium. Two other collections possibly belonging to the original material were found in European herbaria and are discussed below.

As imprinted in the protologue, Miyoshi had written his paper in "Leipzig, 15 October 1893", where he researched from 1891 until 1894. The botanical collections of Leipzig, as well as those of Berlin, were mainly destroyed during the Second World War, and most of their lichen collections were lost. Surprisingly, several of Miyoshi's *U. esculenta* specimens are still present in the Herbarium of Botanischer Garten und Botanisches Museum Berlin-Dahlem Freie Universität, Berlin, Germany (B). Four packet labels indicate that Miyoshi bought them in a Tokyo market in Tokyo and provide no additional information. One packet belonging to exsiccata no. 1613 of Arnold (1899) and another labelled "Japan" and "Ded. [Dedit] Miyoshi" may represent original material, but the collecting date is missing on both labels. A copy of the photograph published by Matsumura & Miyoshi (1899) is included with the "Ded. Miyoshi" specimen. Thalli are glued onto a sheet of paper, but some appear to have subsequently been removed; we did not find on the sheet thalli identical to those in the photo. The handwriting on the labels seems to date from the time when Miyoshi was in Germany and may have been written by P. Hennings, then curator of fungi who published a small contribution on

edible fungi of Japan that included *U. esculenta* (Hennings 1899). Probably he obtained these specimens from Miyoshi for an exhibition at the Botanical Museum in Dresden (H. Sipman, pers. comm.). Because there is no precise data (e.g., locality, collector, date) mentioned on the sheet, we cannot be sure if this specimen was part of the original material.

Other collections were found in the herbarium of Botanische Staatssammlung München, Munich, Germany (M). The collection distributed by Arnold as an exsiccata is also presented in M, but only "Japan" is mentioned as the locality, whereas the collection with the barcode label M-0059004 is referred to one of the localities (Nikko) mentioned in the protologue (Miyoshi 1893). The envelope of M-0059004, which has a printed label "ex coll. M. Miyoshi", undoubtedly belongs to Miyoshi's collections. The locality and collector data are handwritten in ink, but the date of collection is missing. It is impossible to say with full confidence whether Miyoshi wrote it; some letters look similar to his handwriting, but the others do not. The second printed label indicates that this specimen belonged to Dr F. Arnold's herbarium and was received in 1901 by M; clearly, Arnold obtained it from Miyoshi earlier, but no additional information documenting this could be found given the absence of correspondence between Miyoshi and Arnold in Arnold's archive in M (A. Beck, pers. comm.). It appears from label data in TNS that Miyoshi's major collecting activity in Nikko was in 1890; only a few additional Nikko collections date from 1891 and 1900. Thus, we can be almost certain that M-0059004 from Nikko was collected before the protologue was published in 1893.

The single *Gyrophora esculenta* specimen in TNS collected by Miyoshi does not have an original label written by Miyoshi but has a label prepared by Dr Masami Satô (Fig. 1). On this blank printed label "Masami Satô" was imprinted as collector and identifier; but then the name of collector was corrected to "Manabu Miyoshi (?)", and the locality "Honshu: Mt. Kiso-Ontake" and date "Aug. 15, 1890" were added (in Japanese) in Satô's handwriting. Satô also studied *Umbilicaria* and in particular he published a paper on *U. esculenta* (Satô 1968). It would be logical to assume that he examined Miyoshi's collection housed in the University of Tokyo (TI). It seems that the original label lacked the precise information on collector, and Satô added "Manabu Miyoshi" because he knew that Miyoshi was collecting at that date in Ontake Mts. This is the only specimen having the collecting data, and its locality was mentioned in the protologue; thus we assume that the TNS specimen most probably belongs to the original material.

Thus, two collections, in M and in TNS seem to belong to the original material. Both collections are morphologically in agreement with the description although, as for that in B, they do not include fertile material.

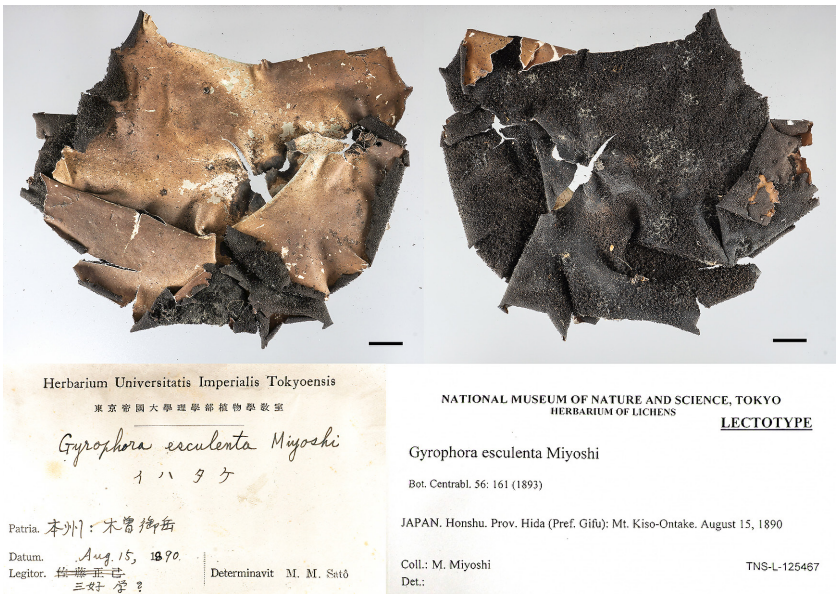

Figure 1. *Gyrophora esculenta* (lectotype, TNS-L-125467). Upper (left) and lower (right) surfaces of the specimen; herbarium labels. Scale = 1 cm.

According to the protologue, Miyoshi investigated not only sterile specimens but also fertile material, which is rarely observed in this species. Nevertheless, since the TNS collection has both locality and date, which agree with the data in the protologue, we designate it as the lectotype of *Gyrophora esculenta* (Fig. 1).

Typification

Umbilicaria esculenta (Miyoshi) Minks, Mém. Herb. Boiss. 22: 22. 1900.

≡ *Gyrophora esculenta* Miyoshi, Bot. Centrabl. 56: 162. 1893.

Type: Japan. Honshu: Mt. Kiso-Ontake, Aug. 15, 1890, leg. M. Miyoshi s.n. (**Lectotype designated here**, TNS-L-125467).

Other original material traced: Japan. Honshu: Nikko, ex. coll. M. Miyoshi s.n. (M-0059004).

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